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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,422	07/05/2006	Roel Daamen	BE02 0022 US	3847

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS  
PO BOX 3001  
BRIARCLIFF MANOR, NY 10510-8001

EXAMINER
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COLEMAN, WILLIAM D

ART UNIT	PAPER NUMBER
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2823

MAIL DATE	DELIVERY MODE
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02/09/2011

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/526,422	<b>Applicant(s)</b> DAAMEN ET AL.	
	<b>Examiner</b> W. David Coleman	<b>Art Unit</b> 2823	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>03/01/2005</u>  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### **Information Disclosure Statement**

The listing of references in the Search Report is not considered to be an information disclosure statement (IDS) complying with 37 CFR 1.98. 37 CFR 1.98(a)(2) requires a legible copy of: (1) each foreign patent; (2) each publication or that portion which caused it to be listed; (3) for each cited pending U.S. application, the application specification including claims, and any drawing of the application, or that portion of the application which caused it to be listed including any claims directed to that portion, unless the cited pending U.S. application is stored in the Image File Wrapper (IFW) system; and (4) all other information, or that portion which caused it to be listed. In addition, each IDS must include a list of all patents, publications, applications, or other information submitted for consideration by the Office (see 37 CFR 1.98(a)(1) and (b)), and MPEP § 609.04(a), subsection I. states, "the list ... must be submitted on a separate paper." Therefore, the references cited in the Search Report have not been considered. Applicant is advised that the date of submission of any item of information or any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the IDS, including all "statement" requirements of 37 CFR 1.97(e). See MPEP § 609.05(a).

Please note that the prior art reference disclose on page 3 of the disclosure, i.e., JP-200144201 does not appear to have any relevance to the present Application.

Correction is required.

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**Claim Rejections - 35 USC § 102**

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

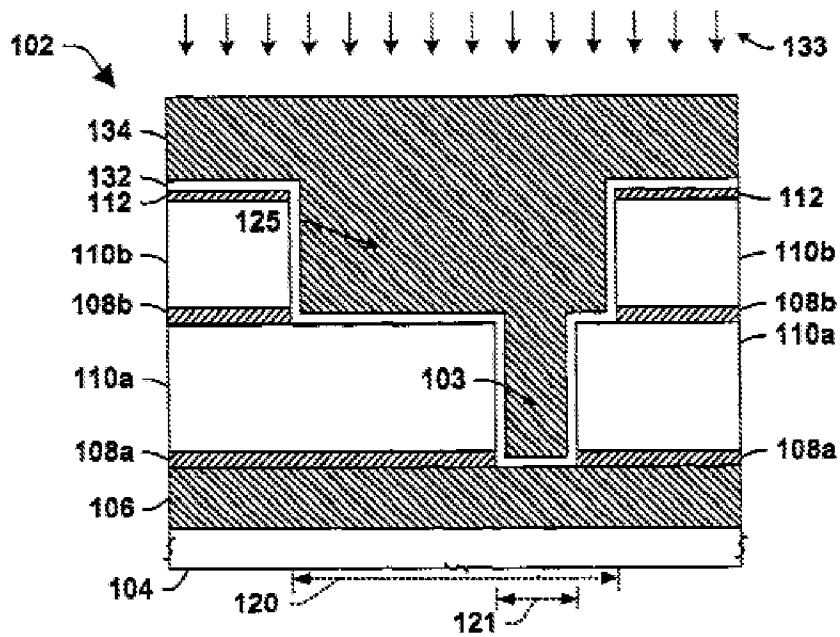
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Smith et al., U.S.

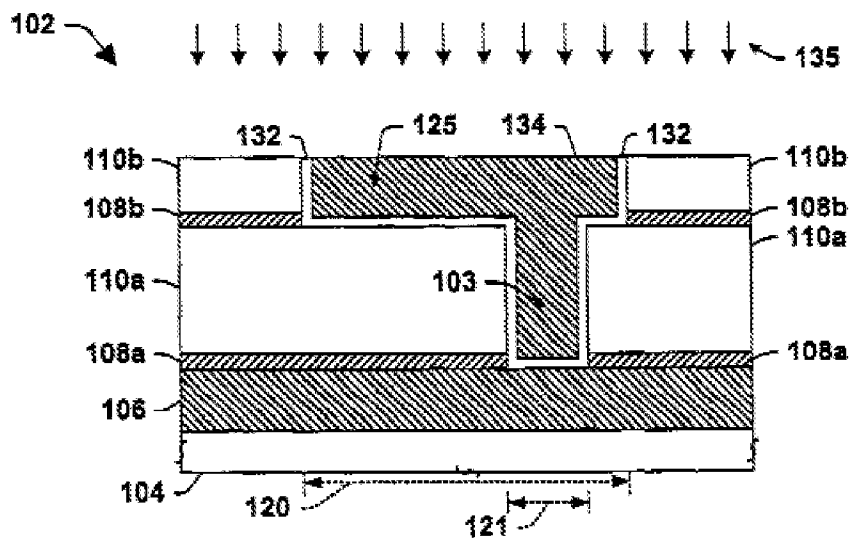
Patent 6,713,402 B2.

Smith discloses a semiconductor process as claimed. See FIGS. 1-15B, where Smith teaches the following limitations.

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**FIG. 11**



**FIG. 12**

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Pertaining to claim 1, Smith teaches a method for fabrication of in-laid metal structures, comprising the steps of:

- providing a substrate **4** with a dielectric material **108a** on top thereof;
- depositing a protection layer **110** on top of the dielectric material,
- depositing a sacrificial layer **112** on top of the protection layer, the sacrificial layer having a mechanical strength with is low than the mechanical strength of the protection layer (please note that the figures are not drawn to scale, the silicon carbide layer is relatively thinner than the claimed protection material layer),
- making an opening through the sacrificial layer, through the protection layer and into the dielectric material,
- depositing a barrier layer **132** in the opening and on the sacrificial layer
- depositing a metal material on the barrier layer, the metal material filling the opening,
- removing portions of the metal material existing beyond the opening by means of polishing, and
- removing the barrier layer and the sacrificial layer in one polishing step.

Pertaining to claim 2, Smith teaches a method according to claim 1, wherein the portions of the metal material existing beyond the opening, the barrier layer and the sacrificial layer are removed in one polishing step.

Pertaining to claim 3, Smith teaches a method according to claim 1, wherein the one polishing step makes use of one consumable set.

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Pertaining to claim 4, Smith teaches a method according to claim 1, wherein the polishing step is a step of chemical mechanical polishing (CMP).

Pertaining to claim 5, Smith teaches a method according to claim 1, wherein the adhesion between the sacrificial layer and the protection layer is weaker than the adhesion between the protection layer and the dielectric material (the Examiner takes the position that because the sacrificial layer **112**, metal layer **134** and barrier layer **132** are removed in one step without removing protection layer **110** by the CMP method, this limitation is taught by Smith).

Pertaining to claim 6, Smith teaches a method according to claim 1, wherein the sacrificial layer is a low-k material (please note that the term low-k material is a relative term, and without and boundaries, one of ordinary skill in the art would only recognize only a sacrificial layer).

Pertaining to claim 7, Smith teaches a method according to claim 1, wherein the dielectric material comprises a low-k material (please see the explanation of the rejection of claim 6 for the present evaluation of claim 7).

Pertaining to claim 8, Smith teaches a method according to claim 1, wherein the step of depositing metal material comprises depositing copper, aluminum, silver, gold or tungsten.

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Pertaining to claim 9, Smith teaches a method according to claim 1, wherein the step of depositing metal material comprises depositing metal material by chemical vapor deposition (please note that Smith teaches "any appropriate copper deposition process may be employed", column 11, lines 24-26, the Examiner takes the position that the term "any" includes CVD, if Applicant should traverse this rejection of claim 9, Applicants should provide support that they are the first to deposit metal using the CVD process).

Pertaining to claim 10, Smith teaches a method for manufacturing a semiconductor device using a method for fabrication of in-laid metal structures according to claim 1.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. David Coleman whose telephone number is 571-272-1856.

The examiner can normally be reached on Monday-Friday 9:00 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

W. David Coleman  
Primary Examiner  
Art Unit 2823

/W. David Coleman/  
Primary Examiner, Art Unit 2823